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## RED GLAZE

R. V. Manukyan<sup>1</sup> and N. S. Davydova<sup>1</sup>Translated from *Steklo i Keramika*, No. 11, p. 32, November, 2000.

The compositions for red glazes with lustrous and dull surfaces are provided. These glazes can be fritted or unfritted. The fritting temperature is 800°C, and the firing temperature is 750–800°C. The red glaze contains the complex silicate material Erevanite-10.

In connection with extensive application of ceramics in construction (for wall facing) and in production of household articles on which increased requirements are imposed, it is necessary to develop more efficient and economical coatings using low-cost raw materials. Here the quality of the finished product largely depends on the glaze coating.

In this context, red glazes with lustrous and dull surfaces and their use as overglaze and underglaze paints are of special interest.

The use of various expensive, scarce, and uneconomical components and components that require high power consumption in batch melting increases the unit production cost.

<sup>1</sup> Institute of General and Inorganic Chemistry, National Academy of Sciences of Armenia, Erevan, Armenia.

TABLE 1

Material component	Batch composition, %, of glaze				
	1	2	3	4	5
Erevanite-10	21.84	23.45	24.86	26.88	15.54
Lead oxide	73.76	72.23	70.90	69.00	79.71
Chromium oxide	4.40	4.32	4.24	4.12	4.76

TABLE 2

Glaze	Weight content, %					
	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Na <sub>2</sub> O	K <sub>2</sub> O	PbO	Cr <sub>2</sub> O <sub>3</sub>
1	20.41	0.10	1.02	0.31	73.76	4.40
2	21.91	0.10	1.10	0.34	72.23	4.32
3	23.22	0.11	1.17	0.36	70.90	4.24
4	25.12	0.12	1.26	0.38	69.00	4.12
5	14.51	0.07	0.73	0.22	79.71	4.76

Consequently, it is important to find ways to reduce the number of components and eliminate high-melting components that raise the fritting and firing temperatures.

Several red glazes have previously been developed: a few-component glaze containing 36.0–38.2% phosphorus oxide and 34.9–38.0% strontium oxide (USSR Inventor's Certif. No. 973494) and a multicomponent glaze with increased fritting (up to 1350°C) and firing (up to 1000°C) temperatures, an acid resistance of up to 50%, and a heat resistance of 200°C (USSR Inv. Certif. No. 1110764).

The developed red glazes (USSR Inv. Certif. No. 172606) have both lustrous and dull surfaces, low fritting and firing temperatures (they can be used without fritting), an acid resistance of up to 94%, and a heat resistance of 550°C.

These glazes are based on the silicate material Erevanite-10 produced by integrated processing of nepheline sienite. Use of Erevanite-10 makes it possible to simultaneously introduce four oxides into the glaze: silicon, aluminum, sodium, and potassium oxides, which simplifies the production technology. Erevanite-10 has the following chemical composition (wt.%): 80.67 SiO<sub>2</sub>, 0.38 Al<sub>2</sub>O<sub>3</sub>, 4.05 Na<sub>2</sub>O, 1.23 K<sub>2</sub>O, and 13.67 calcination loss.

Tables 1 and 2 show five red glaze compositions that can be used fritted or unfritted, but in both cases the mixtures are crushed in an aqueous medium up to complete passage through a sieve with a cell size of 1900 holes/cm<sup>2</sup>.

The TCLE of the developed glazes ranges from  $63.50 \times 10^{-7}$  to  $69.51 \times 10^{-7} \text{ K}^{-1}$ , their color varies from bright red and dark red to black, their surface varies from dull to lustrous (luster 70–80%), and the optimum firing temperature is 750–800°C (without a hold).

If the firing temperature exceeds 800°C, the glaze color is altered (to brown and black), and dripping becomes possible.